

REMARKS

Claims 1-5, 7-13, 15-21, and 23-29 and were rejected. Claims 1, 9, 12, 16 have been amended herein. Claims 6, 14, and 22 have been cancelled previously. The applicants request reconsideration of the rejections of all pending claims.

I. Rejection of Claims 1-18 Under 35 U.S.C. §112

Claims 1-18 were rejected under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The claims have been amended herein so as to overcome the rejections. More specifically, the composite images have been better defined in order to distinguish them from the reference images.

Based on the foregoing, the applicants request reconsideration of the rejections.

II. Rejection of Claims 1, 7, 8, 19-21, 23, 24, 26, and 27 Under 35 U.S.C. §102(b)

Claims 1, 7, 8, 19-21, 23, 24, 26, and 27 were rejected under 35 U.S.C. §102(b) as being anticipated by of Fuji (U.S. 2002/0057736).

CLAIM 1

Claim 1, as amended herein, reads as follows:

A device for processing an image comprising:
decompose logic that is operable to decompose a first input image
into a plurality of first composite images that comprise different frequency
bands of said first input image;

storage coupled to said decompose logic to store said plurality of first composite images as reference images for comparison with a second input image;

comparison logic to compare second composite images with said reference images to produce preliminary motion values for said different frequency bands and wherein said comparison logic compares said preliminary motions values from different bands of said frequency bands to determine differences based on features in the spatial domain; and

logic to determine a final motion value from said preliminary motion values.

According to the office action, the element of “decompose a first input image into a plurality of first composite images that comprise different frequency bands of said first input image” is disclosed by Fuji in Fig. 3, reference 12b, Fig. 4, and paragraphs 52-64 (the office action referred to the rejection of claim 19 for this element of Fuji).

The aforementioned element of claim 1 decomposes a single image into a plurality of composite images that comprise different frequency bands. Referring to paragraph 59 of Fuji, Fuji decomposes four different images into four different composite images. The section of paragraph 59 that explains the different images states the following:

Four odd fields in time series to be stored into the original image field memory 12a are shown to the left of the drawing. Specifically, they are an odd field 1 configuring one frame of the original image, an odd field 2 configuring one frame of the next original image, the odd field 3 configuring one frame of the next original image but one, and an odd field 4 configuring one frame of the next original image but two. The odd field 2 is a field after the odd field 1 in terms of time, and the odd field 3 is a field after the odd field 2 in terms of time.

Thus, the images of the left side of Fig. 4 are actually odd fields of four different images. As disclosed in Fuji, each of these images is decomposed via one wavelet transformation, which is one frequency representation.

As stated in claim 1, one image is decomposed into a plurality of composite images that comprise different frequency bands. This plurality of different composite images from a single image is not disclosed by Fuji.

Based on the foregoing, Fuji fails to disclose all the elements of claim 1 and, therefore, cannot anticipate claim 1. Therefore, the applicant requests reconsideration of the rejection.

CLAIMS 7 AND 8

Claims 7 and 8 are dependent on claim 1 and are deemed allowable by way of their dependence and for other reasons. Accordingly, the applicants request reconsideration of the rejections.

CLAIM 19

Claim 19 recites the following:

A method of motion detection using multiple frequency band image processing comprising:

receiving an input image;

decomposing said input image into a plurality of composite images that comprise different frequency bands of said input image;

comparing said composite images with reference composite images to produce preliminary motion values for said different frequency bands; and

determining a final motion value from said preliminary motion values, wherein said determining step compares said preliminary motion values from said different frequency bands to determine differences based on features repeating at different regularities in the spatial domain.

Claim 19 includes the element of “decomposing said input image into a plurality of composite images that comprise different frequency bands of said input image.” As stated above in the traversal to the rejection of claim 1, Fuji decomposes several images into single, not a plurality of, frequency representations. Accordingly, Fuji cannot disclose “decomposing said input image into a plurality of composite images that comprise different frequency bands of said input image,” as claimed.

Based on the foregoing, Fuji does not disclose all the elements of claim 19 and, therefore, cannot anticipate claim 19. Therefore, the applicant requests reconsideration of the rejection.

CLAIMS 20, 21, 23, 24, 26, AND 27

Claims 20, 21, 23, 24, 26, and 27 are dependent on claim 19 and are deemed allowable by way of their dependence and for other reasons. Accordingly, the applicants request reconsideration of the rejections.

III. Rejection of Claims 2-5, 9, 12, 13, 15, 16, and 25 Under 35 U.S.C. §103(a)

Claims 2-5, 9, 12, 13, 15, 16, and 25 were rejected under 35 U.S.C. §103(a) as being unpatentable over Fuji (U.S. 2002/0057736) as applied to claims 1, 7, 8, 19-21, 23, 24, 26, and 27, and further in view of Kroos (U.S. 6,931,145).

CLAIMS 2-5 AND 9

Claims 2-5 and 9 are dependent on claim 1 and are deemed allowable by way of their dependence and for other reasons. Accordingly, the applicants request reconsideration of the rejections.

CLAIM 12

Claim 12, as amended herein, reads as follows:

An optical navigation system comprising:

an image sensor;

transform logic coupled to the image sensor that is operable to perform a Discrete Wavelet Transform to decompose an input image from said image sensor into a plurality of first composite images that comprise different frequency bands of said input image, wherein said transform logic produces images in which an "x" component and a "y" component comprise different frequency bands from each other, wherein repetitive features in the x-axis or y-axis of said input image are selectively filtered;

storage coupled to said transform logic to store a plurality of first composite images as reference images for comparison with a second input image;

comparison logic to compare second composite images with said reference images to produce preliminary motion values for said different frequency bands; and

logic to determine a final motion value from said preliminary motion values.

The office action relies on Fuji to teach performing “a Discrete Wavelet Transform to decompose an input image from said image sensor into a plurality of first composite images that comprise different frequency bands of said input image.”

As stated above in the traversal to the rejection of claim 1, Fuji decomposes several images into single, not a plurality of, frequency representations. Accordingly, Fuji cannot disclose performing “a Discrete Wavelet Transform to decompose an input image from said image sensor into a plurality of first composite images that comprise different frequency bands of said input image,” as claimed.

Based on the foregoing, neither Fuji, nor Friend, nor their combination disclose all the elements of claim 12. Thus, the references cannot render claim 12 obvious. Therefore, the applicant requests reconsideration of the rejection.

CLAIMS 13, 15, 16, AND 25

Claims 13, 15, 16, and 25 are dependent on allowable base claims and are deemed allowable by way of their dependence and for other reasons. Accordingly, the applicants request reconsideration of the rejections.

IV. Rejection of Claims 10 and 17 Under 35 U.S.C. §103(a)

Claims 10 and 17 were rejected under 35 U.S.C. §103(a) as being unpatentable over Fuji (U.S. 2002/0057736) and Kroos (U.S. 6,931,145) and further in view of Khansari (U.S. 6,141,448).

Claims 10 and 17 are dependent on allowable base claims and are deemed allowable by way of their dependence and for other reasons. Accordingly, the applicants request reconsideration of the rejections.

V. Rejection of Claims 11 and 28 Under 35 U.S.C. §103(a)

Claims 11 and 28 were rejected under 35 U.S.C. §103(a) as being unpatentable over Fuji (U.S. 2002/0057736), and further in view of Zafar.

Claims 11 and 28 are dependent on allowable base claims and are deemed allowable by way of their dependence and for other reasons. Accordingly, the applicants request reconsideration of the rejections.

VI. Rejection of Claim 18 Under 35 U.S.C. §103(a)

Claim 18 was rejected under 35 U.S.C. §103(a) as being unpatentable over Friend, Fuji (U.S. 2002/0057736), Kroos, and further in view of Zafar.

Claims 18 is dependent on claim 12 and is deemed allowable by way of its dependence and for other reasons. Accordingly, the applicants request reconsideration of the rejection.

VII. Rejection of Claim 29 Under 35 U.S.C. §103(a)

Claim 29 was rejected under 35 U.S.C. §103(a) as being unpatentable over Friend and Fuji (U.S. 2002/0057736), and further in view of Rovati (7,099,512).

Claim 29 is dependent on claim 19 and is deemed allowable by way of its dependence and for other reasons. Accordingly, the applicants request reconsideration of the rejection.

In view of the above, all of the pending claims are now believed to be in condition for allowance and a notice to that effect is earnestly solicited.

Respectfully submitted,
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